

**CLAIMS:**

1. An autostereoscopic optical apparatus for viewing a stereoscopic virtual image comprising a left image to be viewed by an observer at a left viewing pupil and a right image to be viewed by the observer at a right viewing pupil, the apparatus comprising:
- (a) a left pupil imaging system for forming the left image, comprising:
- (i) a left curved mirror having a left mirror center of curvature and a left focal surface;
- (ii) a left image generation system for projecting a left curved image toward the left focal surface; wherein the exit pupil of the left image generation system and the left curved image center of curvature are substantially coincident and lie substantially at the left mirror center of curvature;
- (b) a right pupil imaging system for forming the right image, comprising:
- (i) a right curved mirror having a right mirror center of curvature and a right focal surface;
- (ii) a right image generation system for projecting a right curved image toward the right focal surface, wherein the exit pupil of the right image generation system and the right curved image center of curvature are substantially coincident and lie substantially at the right mirror center of curvature; and
- (c) a beamsplitter disposed to fold both left and right image paths to form:
- (i) at the left viewing pupil, a real image of the left image generation system pupil and a virtual image of the left curved image; and

(ii) at the right viewing pupil, a real image of the right image generation system pupil and a virtual image of the right curved image.

5                    2.        An autostereoscopic optical apparatus according to claim 1 wherein said left image generation system comprises an image source selected from a group consisting of a CRT, an emissive array, an LCD display, an OLED.

                         3.        An autostereoscopic optical apparatus according to claim 2  
10 further comprising a focusing optical element adjacent to said image source for directing light toward said left image generation system entrance pupil.

                         4.        An autostereoscopic optical apparatus according to claim 3 wherein said focusing optical element is taken from the group consisting of a  
15 Fresnel lens, a holographic optical element, a diffraction optical element, and a lens.

                         5.        An autostereoscopic optical apparatus according to claim 1 wherein said viewing pupils range in size between 5 mm and 60 mm.

20                    6.        An autostereoscopic optical apparatus according to claim 1 wherein said viewing pupils are separated by an interocular distance ranging between 55 mm and 75 mm.